

Alternative approaches to the measurement of
health and individual welfare:

The happiness approach

Alois Stutzer
University of Basel

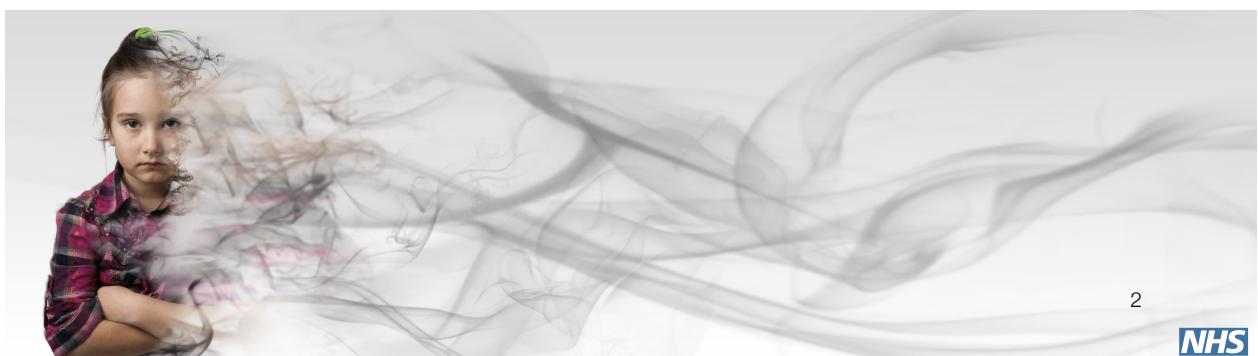
Spanish Health Economics Meeting (AES) 2015

Granada, June 17, 2015

Smoking: A Big Public Health Issue

- (Passive) smoking has negative health consequences.
- Many tobacco control policies are introduced with the aim to reduce smoking (and evaluated accordingly).
 - Cigarette taxes → cigarette prices
 - Smoking bans

} Smoking
prevalence?



Welfare Consequences

- Criticism: Do regulations that reduce smoking increase individual welfare?
 - Smokers are not force-fed geese!
 - There is a consumption value of smoking.
 - Substitution effects?
- A successful tobacco control policy internalizes negative externalities
 - What are the net welfare effects?

3

Welfare Consequences

- How can basic health policies/rules be evaluated when behavioral reactions imply ambiguous welfare consequences?
- Suggestion: Study net effect on a proxy of individual welfare, e.g., reported life satisfaction!
- Criticism: People are different:
 - Smokers, non-smokers and “wanna be quitters”
 - Who benefits and who loses?
 - Effects on life satisfaction for different groups

4

Outline

1. Measuring Subjective Well-Being
2. Application to Public Health
 - Tobacco control policies and subjective well-being
 - a) Policy Perspective
 - (Smoking Behavior)
 - Welfare Effects
 - b) Extension: Behavioral Economic Perspective
 - Smokers vs. Non-Smokers
 - Smokers with Limited Will Power
3. Concluding Remarks

5

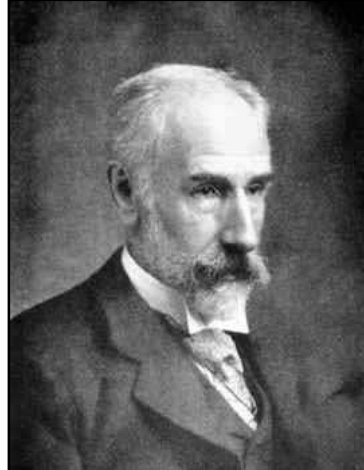
1. Measuring Subjective Well-Being

Measuring subjective well-being

An old dream in economics

- Jeremy Bentham (1748-1832)
- Francis Edgeworth (1845-1926): „hedonimeter“

Auto-icon of
Bentham
displayed at the
University College
London



Edgeworth

7

The rejection of happiness:

Traditional microeconomics (Lionel Robbins & John Hicks)

- There is no meaningful physiological measure of individual happiness
 - Happiness is not cardinally measurable
 - Happiness is not interpersonally comparable
- Insights of economics are possible without measuring individual welfare

New approach: Asking for subjective well-being

„Happiness revolution“ in economics

- Happiness of people can be captured and analyzed despite of its subjective nature
- People are directly asked how satisfied they are with their life
- Individuals can evaluate best, whether
 - they are happy or unhappy
 - they judge the quality of their life as favorable or not

(Liberal tradition in economics: Reliance on the judgment of the individual who is directly involved.)

9

Survey questions about subjective well-being

All things considered, how satisfied are you with your life as a whole nowadays?

Please answer using this card, where 0 means extremely dissatisfied and 10 means extremely satisfied.

Extremely
dissatisfied

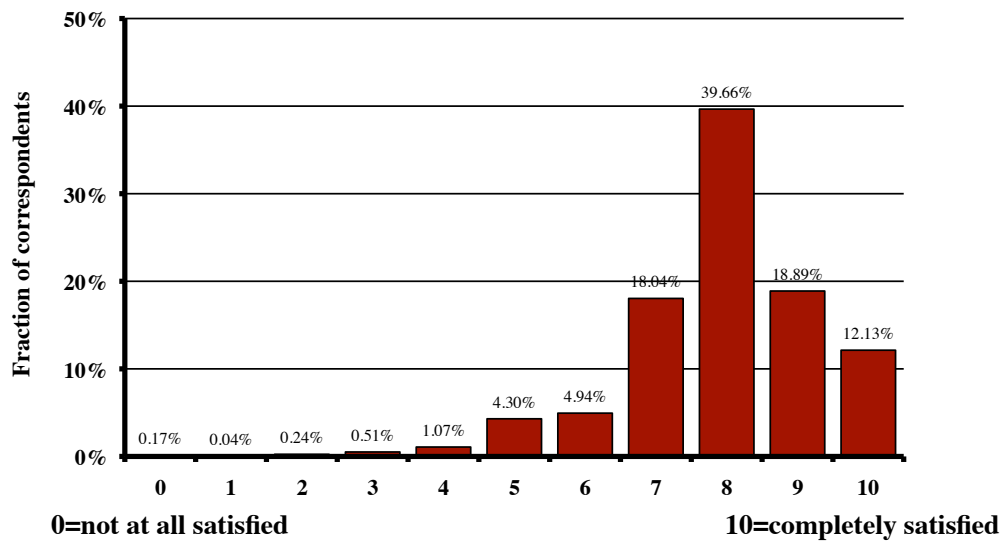
Extremely
satisfied

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Source: European Social Survey (2002-)

10

Satisfaction with life in Spain



Source: European Social Survey (2002-)

11

Do subjective measures of well-being provide valid information?

Numerous validation studies in psychology

- Different measures of happiness correlate well with one another.
- Measures of SWB correspond well to other observations of the same phenomenon.
- Happy people are rated as happy by friends and family members as well as by spouses.



12

2. Application to Public Health

Tobacco control policies and subjective well-being

Policy Perspective

Motivation

«Tobacco control policies should aim at internalizing the social costs of smoking»

- Tobacco control policies ...
 - protect non-smoker from second-hand smoke
 - motivate smokers to smoke less
- Policy hypotheses for the evaluation of bans and taxes
 1. Negative impacts on smoking behavior
 2. Positive net welfare effects

Policy Perspective

Related Evidence

- Smoking bans
 - Reduction in hospital admissions (e.g. Meyers et al. 2009)
 - Negative effect of bans on smoking prevalence (e.g. Hopkins et al. 2010, Anger et al. 2011)
 - Displacement of smoking with no effect on prevalence (Adda and Cornaglia 2010)
- Cigarette prices
 - Large variation in the (negative) price elasticity across studies (Cawley and Ruhm 2012)
 - More nicotine extraction and no effect on demand (Adda and Cornaglia 2006, 2012)

15

The Effect of Smoking Bans and Cigarette Prices on SWB in Europe

Data: Eurobarometer (EB)

- Repeated cross-section data
 - 40 countries/regions
 - 1990-2011 (41 survey waves)
 - N=634,951
- Question on life satisfaction
- Socio-demographic characteristics
 - Sex, age, education, no. of children in same household, occupation

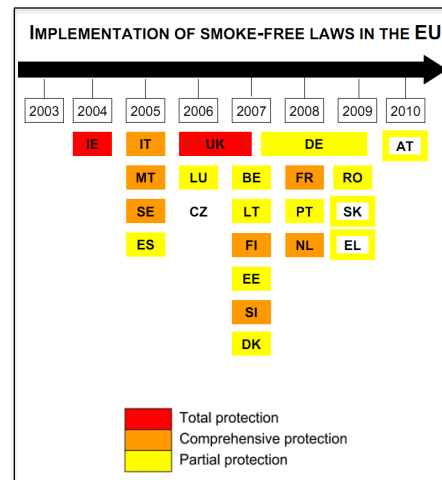


16

Empirical Analysis

Data: Smoking Bans

- Variation in introduction dates
- Heterogeneity of bans
 - Workplace
 - Hospitality sector
- Tobacco Control Scale (TCS)
 - Bans qualified by sub-scale scores
 - Workplace ban: max. 10 points
 - Hospitality sector ban: max. 8 points



Source: European Commission 2010

→ Index [0,1]

17

Empirical Analysis

Example: Italy

- Introduction of workplace ban: January 10, 2005
 - TCS: 8 points (out of 10)
- Introduction of hospitality sector ban: January 10, 2005
 - TCS: 6 points (out of 8)

→ Smoking ban = 0

until January 10, 2005

→ Smoking ban = $(8 + 6) / 18 = \underline{0.78}$

since January 10, 2005

18

Empirical Analysis

Empirical Strategy: Average Effect

- Differences-in-differences idea:

$$LS_{ijt} = \beta_0 + \beta_1 ban_{jt} + \beta_2 prices_{jt} + \beta_3 X_i + \beta_4 Z_{jt} + \beta_5 D_j + \beta_6 D_t + \beta_7 \tau_j + \varepsilon_{ijt}$$

- LS_{ijt} : reported life satisfaction (1 'not at all satisfied' – 4 'very satisfied')
- ban_{jt} : workplace + hospitality sector ban [0,1]
- $prices_{jt}$: real cigarette prices per 1000, ln
- X_i : socio-demographic characteristics
- Z_{jt} : country-level variables
- D_j, D_t : country/region specific and time specific effects
- τ_j : country specific time trends

19

Table 1: Smoking bans, cigarette prices and life satisfaction in 40 European countries and regions, 1990-2011

Dependent variable: Life satisfaction					
	I	II	III	IV	V
Smoking ban	0.006 (0.37)		0.001 (0.07)	0.005 (0.25)	0.002 (0.12)
ln(cigarette price)		-0.083 (-1.38)	-0.082 (-1.37)	-0.069 (-1.32)	-0.054 (-1.19)
Other tobacco policies				-0.000 (-0.02)	0.002 (0.31)
ln(beer tax)				-0.025 (-0.71)	-0.008 (-0.20)
ln(GDP per capita)					-0.043 (-0.19)
Unemployment rate					-0.009* (-1.79)
Inflation rate					-0.001 (-0.32)
Individual characteristics	Yes	Yes	Yes	Yes	Yes
Country/region FE	Yes	Yes	Yes	Yes	Yes
Survey wave FE	Yes	Yes	Yes	Yes	Yes
Country-spec. time trends	Yes	Yes	Yes	Yes	Yes
No. of observations	629,930	629,930	629,930	629,930	629,930
No. of clusters	40	40	40	40	40
R ²	0.21	0.21	0.21	0.21	0.22

Notes: OLS estimations. T-values in parentheses. Standard errors are clustered on the country/region level.

Significance levels: * .05 < p < .1, ** .01 < p < .05, *** < .01.

20

Interim Conclusions

Smoking prevalence in Europe

- Empirical analysis: Longitudinal design matters
 - Concurrent trends in smoking behavior and changes in policy
- Smoking ban: no clear indication of a large negative effect
- Price elasticity: negative but small (≈ -0.1 long-term) and imprecisely measured

Welfare effects

- No systematic average effect of smoking bans
- Potentially large and negative effects of higher prices

21

Outline

1. Measuring Subjective Well-Being
2. Application to Public Health

Tobacco control policies and subjective well-being

- a) Policy Perspective
 - (Smoking Behavior)
 - Welfare Effects
- b) Extension: Behavioral Economic Perspective
 - Smokers vs. Non-Smokers
 - Smokers with Limited Will Power

3. Concluding Remarks

22

Traditional vs. Behavioral Economics

Motivation: One Step Back



Traditional vs. Behavioral Economics

Motivation

Traditional Economics		Behavioral Economics	
ASSUMPTIONS	<ul style="list-style-type: none"> ✧ Rational consumers ✧ Time consistency 	ASSUMPTIONS	<ul style="list-style-type: none"> ✧ Consumers with limited will power ✧ Time inconsistency
	<p>MODELS</p> <ul style="list-style-type: none"> ✧ <u>Rational addiction</u> (Becker & Murphy 1988) 		<p>MODELS</p> <ul style="list-style-type: none"> ✧ <u>Multiple selves models</u> (Gruber & Köszegi 2001, 2004) ✧ <u>Temptation models</u> (Bernheim & Rangel 2004)
<p>Impact of bans and prices:</p> <ul style="list-style-type: none"> ⇒ <u>Nonsmokers</u>: better off ⇒ <u>Smokers</u>: smoke less & worse 		<ul style="list-style-type: none"> ⇒ <u>Nonsmokers</u>: better off ⇒ <u>Smokers</u>: smoke less & potentially better off 	

Traditional vs. Behavioral Economics

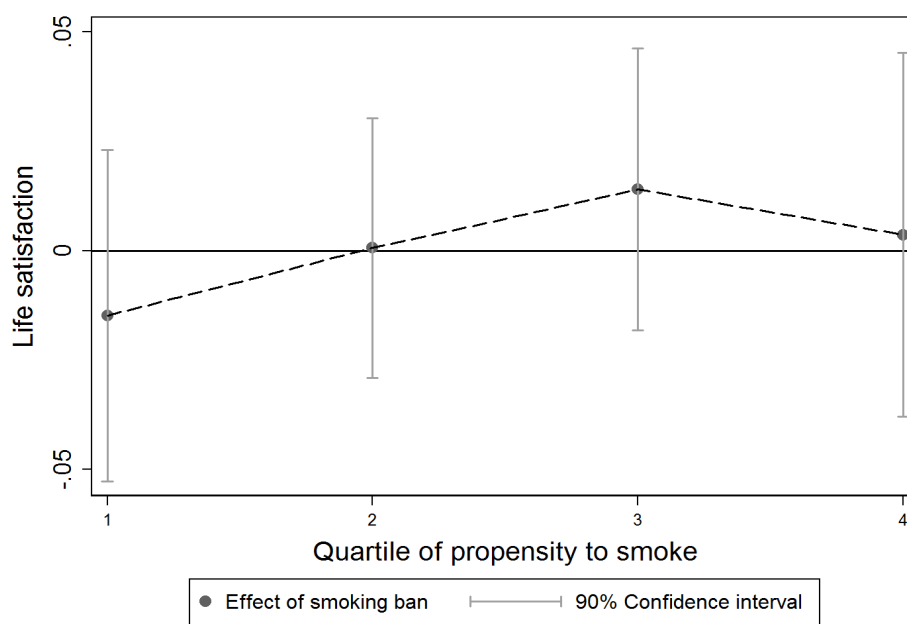
Smokers vs. Non-smokers

- How are smokers and nonsmokers affected by smoking bans and higher cigarette prices?
- Challenges
 - Smoking bans and cigarette prices are expected to affect smoking behavior.
 - **Observed smokers** are a different selection of people after the introduction of some tobacco control policy than before.
- Alternative tagging of **likely smokers**: “propensity to smoke”
 - Impute a predicted probability to be a smoker for each individual in the data set
 - Probability as if no smoking ban were in place (and for a given level of cigarette prices)

25

Traditional vs. Behavioral Economics

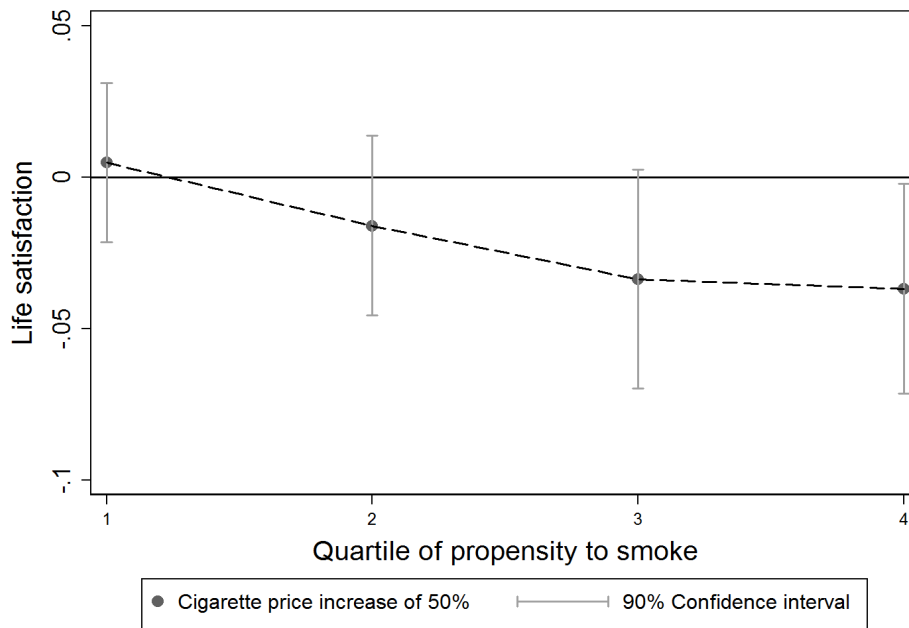
Smokers vs. Non-smokers: Smoking Bans



26

Traditional vs. Behavioral Economics

Smokers vs. Non-smokers: Cigarette Prices



27

Traditional vs. Behavioral Economics

Smoking Behavior and Will Power

- Who might potentially benefit from tobacco policies?
- Challenge
 - Tagging smokers with potentially limited will power (marginal smokers)
- Question asked to current smokers:

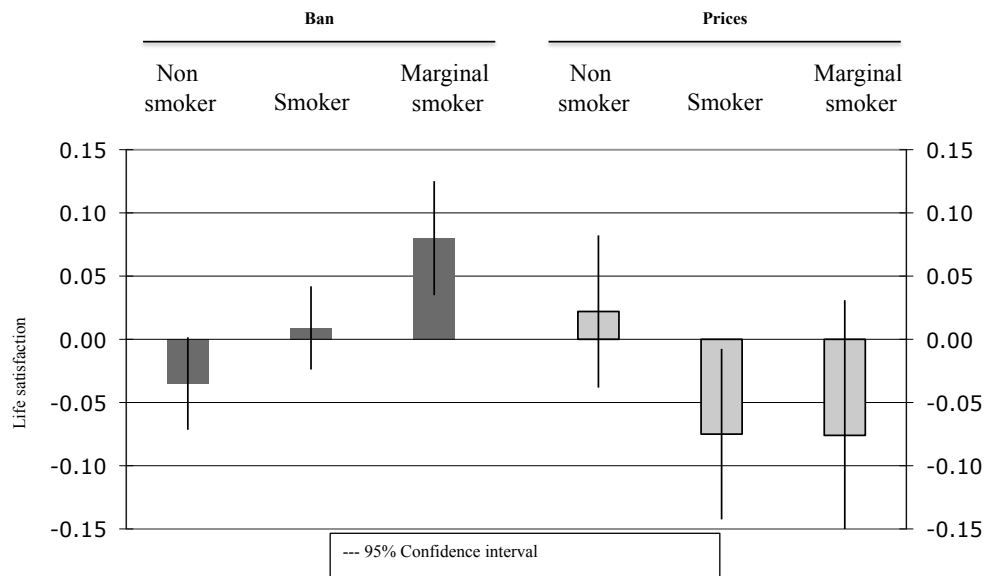
“Have you tried to give up smoking in the last 12 month?”
(EB 2006 and 2009)
- Calculation of **propensities** for each individual to be a **nonsmoker**, a **smoker** or a **marginal smoker**

28

Traditional vs. Behavioral Economics

Smoking Behavior and Will Power

- Marginal effect of bans and cigarette prices



29

3. Concluding Remarks

Conclusions I

Application to preventive health policy:
Tobacco control policies and life satisfaction

1. Overall
 - a) Negative effect of higher cigarette prices
 - b) No systematic effect of smoking bans

31

Conclusions I

2. Traditional vs. behavioral economic perspective
 - a) Negative effects of prices for people with a high propensity to smoke
 - Opposite finding of Gruber and Mullainathan (2005)
 - b) Marginal smokers benefit from smoking bans but suffer from higher cigarette prices

32

Conclusions I

3. Interpretation

- a) Net effects hide differential effects for specific populations
- b) Differential effectiveness of tobacco policies as collective self-binding mechanisms
- c) Evidence for cue-triggered models of decision-making and addiction

33

Conclusions II

- Data on subjective well-being are a valuable tool for research in health economics and for health policy evaluation
 - Evaluation of net welfare effects when behavioral reactions are difficult to interpret
 - Trade-offs with life expectancy: Evaluations ideally are complemented with analyses assessing the effects on longevity.
 - *Life Satisfaction Approach* for the valuation of public goods
 - Based on estimates for the marginal effect of transfers to subjective well-being, it would be possible to value public health policies in monetary terms within a common

34